

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A travel safety device for a vehicle comprising:

an object detecting unit which detects an object existing in a traveling direction of the vehicle;

a correlation calculating unit which calculates a correlation involving a distance between the vehicle and the object based on a detection result of the object detecting unit;

a safety unit including an automatic brake unit which automatically decelerates the vehicle and a seatbelt device which automatically tightens the seatbelt and releases the tightening thereof; and

a safety device operation control unit which determines a possibility of contact between the vehicle and the object based on the correlation calculated by the correlation calculating unit, and when it is predicted that there is a possibility of contact simultaneously actuates the automatic brake unit and seatbelt device,

~~wherein the automatic brake unit is constructed so as to be capable of decelerating the vehicle in a plurality of different deceleration patterns, and the seatbelt device is constructed so as to be capable of tightening and releasing the~~

~~seatbelt in a plurality of different operation patterns,~~

wherein the safety device operation control unit is constructed so that, when the distance between the vehicle and the object enters a predetermined range based on the correlation calculated by the correlation calculating unit, the automatic brake unit causes generation of a deceleration to a degree, which is capable of allowing the occupant to recognize that a braking force has been generated, ~~and at the same time the correlation calculating unit predicts a possibility of contact with a stationary object or a mobile object in the traveling direction of the vehicle~~ increasing in a stepwise manner, and the seatbelt device alternates between tightening and releasing of the seatbelt,

wherein a period of tightening of the seatbelt is set to be longer than a period of releasing of the seatbelt, ~~and~~

~~wherein when there is a possibility of contact with the mobile object, a tightening tension of the seatbelt is set to be greater than a tightening tension which is set when there is a possibility of contact with the stationary object.~~

Claims 2-3 (cancelled)

Claim 4 (previously presented): The travel safety device for a vehicle according to claim 1, wherein the safety device operation control unit is constructed so that an even higher degree of deceleration is generated by the automatic brake unit if such a state is maintained for a predetermined period of time, where the distance between the vehicle and the object enters a predetermined range based on the correlation calculated by the correlation calculating unit.

Claim 5 (original): The travel safety device for a vehicle according to claim 4, wherein the safety device operation control unit is constructed so that, if such a state is maintained for a predetermined period of time, where the distance between the vehicle and the object enters a predetermined range on the basis of the correlation calculated by the correlation calculating unit, the seatbelt device causes the seatbelt to be fixed in its stopped state for at least a predetermined period of time after the seatbelt is tightened.

Claim 6 (previously presented): The travel safety device for a vehicle according to claim 5, further comprising:

a braking operation detecting unit which detects a braking operation carried out by a driver; and

a vehicle speed detecting unit which detects the speed of the vehicle, wherein the safety device operation control unit is constructed so that fixing of the seatbelt in its stopped state by the seatbelt device is released in at least one of the states where it is detected based on a detection result of the braking operation detecting unit that a braking operation is released after the braking operation is carried out by a driver and where it is detected based on a detection result of the vehicle speed detecting unit that the vehicle stops.

Claim 7 (previously presented): The travel safety device for a vehicle according to claim 1, further comprising a braking operation detecting unit which detects a braking operation carried out by a driver, wherein the safety device operation control unit is constructed so that, on the basis of a braking operation

detected by the braking operation detecting unit, it determines whether or not there is a possibility of a contact between the vehicle and the object, and increases a tightening tension of the seatbelt by the seatbelt device in a case in which it is predicted based on a braking operation carried out by a driver that there is a possibility of a contact prior to a case in which it is predicted, based on the correlation between the vehicle and the object, which is calculated by the correlation calculating unit, that there is a possibility of contact therebetween.

Claim 8 (previously presented): The travel safety device for a vehicle according to claim 1, further comprising an in-vehicle LAN, wherein the correlation calculating unit, a brake control unit which controls the automatic brake unit and an electric seatbelt control unit which controls the seatbelt device are connected to a connection bus of the in-vehicle LAN.

Claim 9 (cancelled)

Claim 10 (original): The travel safety device for a vehicle according to claim 1, further comprising a collision sensor which detects a collision of a vehicle, wherein the safety device is further provided with airbag devices, wherein the safety device operation control unit is constructed so that it simultaneously actuates the automatic brake unit and the seatbelt device when it is predicted that there is a possibility of a contact, and actuates the airbag devices when the collision sensor detects collision of the vehicle.

Claims 11-14 (cancelled)

Claim 15 (new): A travel safety device for a vehicle comprising:

an object detecting unit which detects an object existing in a traveling direction of the vehicle;

a correlation calculating unit which calculates a correlation involving a distance between the vehicle and the object based on a detection result of the object detecting unit;

a safety unit including an automatic brake unit which automatically decelerates the vehicle and a seatbelt device including an electric motor which automatically tightens the seatbelt and releases the tightening thereof; and

a safety device operation control unit which determines a possibility of contact between the vehicle and the object based on the correlation calculated by the correlation calculating unit, and, when it is predicted that there is a possibility of contact, simultaneously actuates the automatic brake unit and seatbelt device,

wherein the safety device operation control unit is constructed so that, when the distance between the vehicle and the object enters a predetermined range based on the correlation calculated by the correlation calculating unit, the automatic brake unit causes generation of a deceleration to a degree which is capable of allowing the occupant to recognize that a braking force has been generated, and the seatbelt device alternates between tightening and releasing the seatbelt,

when such a state is maintained for a predetermined period of time, where the distance between the vehicle and the object enters a predetermined range, an even higher degree of deceleration is generated by the automatic brake unit, and the seatbelt device causes the seatbelt to be fixed in its stopped state for at least a predetermined period of time after the seatbelt is tightened,

in a tightening operation of the seatbelt, a current value of the electric motor is temporarily increased by setting the current limit to a predetermined initial limit value for a predetermined initial time immediately after rotation of the electric motor is commenced to remove slack in the seatbelt, and the current limit thereafter is set to a predetermined limit value which is lower than the initial limit value to lower the current value, and the tension of the predetermined value is generated for the seatbelt.

Claim 16 (new): A travel safety device for a vehicle comprising:

an object detecting unit which detects an object existing in a traveling direction of the vehicle;

a correlation calculating unit which calculates a correlation involving a distance between the vehicle and the object based on a detection result of the object detecting unit;

a safety unit including an automatic brake unit which automatically decelerates the vehicle and a seatbelt device which automatically tightens the seatbelt and releases the tightening thereof;

a braking operation detecting unit which detects a braking operation carried out by a driver;

a vehicle speed detecting unit which detects the speed of the vehicle; and

a safety device operation control unit which determines a possibility of contact between the vehicle and the object based on the correlation calculated by the correlation calculating unit, and, when it is predicted that there is a possibility of contact, simultaneously actuates the automatic brake unit and seatbelt device,

wherein the safety device operation control unit is constructed so that, when the distance between the vehicle and the object enters a predetermined range based on the correlation calculated by the correlation calculating unit, the automatic brake unit causes generation of a deceleration to a degree which is capable of allowing the occupant to recognize that a braking force has been generated, and the seatbelt device alternates between tightening and releasing of the seatbelt,

when such a state is maintained for a predetermined period of time, where the distance between the vehicle and the object enters a predetermined range, an even higher degree of deceleration is generated by the automatic brake unit, and the seatbelt device causes the seatbelt to be fixed in its stopped state for at least a predetermined period of time after the seatbelt is tightened,

the seatbelt fixed in its stopped state by the seatbelt device is released in at least one of the states where it is detected based on a detection result of the braking operation detecting unit that a braking operation is released after the braking operation is carried out by a driver and where it is detected based on a detection result of the vehicle speed detecting unit that the vehicle stops.

Claim 17 (new): A travel safety device for a vehicle comprising:

an object detecting unit which detects an object existing in a traveling direction of the vehicle;

a correlation calculating unit which calculates a correlation involving a distance between the vehicle and the object based on a detection result of the object detecting unit;

a safety unit including an automatic brake unit which automatically

decelerates the vehicle, a seatbelt device which automatically tightens the seatbelt and releases the tightening thereof, and airbag devices;

a collision sensor which detects a collision of the vehicle; and

a safety device operation control unit which determines a possibility of contact between the vehicle and the object based on the correlation calculated by the correlation calculating unit, and, when it is predicted that there is a possibility of contact, simultaneously actuates the automatic brake unit and seatbelt device,

wherein the automatic brake unit is constructed so as to be capable of decelerating the vehicle in a plurality of different deceleration patterns, and the seatbelt device is constructed so as to be capable of tightening and releasing the seatbelt in a plurality of different operation patterns,

wherein the safety device operation control unit is constructed so that, when the distance between the vehicle and the object enters a predetermined range based on the correlation calculated by the correlation calculating unit, the automatic brake unit causes generation of a deceleration to a degree which is capable of allowing the occupant to recognize that a braking force has been generated, and the seatbelt device alternates between tightening and releasing the seatbelt,

when such a state is maintained for a predetermined period of time, where the distance between the vehicle and the object enters a predetermined range, an even higher degree of deceleration is generated by the automatic brake unit, and the seatbelt device causes the seatbelt to be fixed in its stopped state for at least a predetermined period of time after the seatbelt is tightened, and

actuates the airbag devices when the collision sensor detects the collision of the vehicle.